

## **CLAIMS**

1. A liquid oral therapeutic dental composition, that increases in viscosity upon contact with moisture following application to an oral cavity surface, comprising:

a moisture responsive gel carrier comprising a moisture sensitive polymer complex and a water-soluble salt; and

a therapeutic agent dispersed in the responsive gel carrier.

2. The composition of Claim 1, wherein the moisture responsive gel carrier further comprises a thermally responsive polymer.

3. The composition of Claim 1, wherein the moisture responsive gel carrier further comprises a pH or ion responsive polymer.

4. The composition of claim 1, wherein the therapeutic agent is selected from the group consisting of antimicrobial agents, tooth whiteners, anti-inflammatory agents, tooth desensitizers, anticaries agents, tartar control agents, tooth and gum surface protectants, tooth stain prevention agents and agents effective against dental plaque, halitosis, gingivitis, periodontal disease, oral ulcers and other diseases, afflictions or symptoms of the oral cavity.

5. The composition of claim 1, wherein the therapeutic agent comprises a tooth whitener.

6. The composition of claim 5, wherein the tooth whitener is selected from the group consisting of an alkali metal percarbonate, carbamide peroxide, sodium perborate, potassium persulfate, calcium peroxide, zinc peroxide, chlorine dioxide, sodium chlorite, a hydrogen peroxide complex, hydrogen peroxide and mixtures of any of the foregoing.

7. The composition of claim 5, wherein the tooth whitener comprises about 0.01% (w/w) to about 20.0% (w/w) of hydrogen peroxide.
8. The composition of claim 5, wherein the tooth whitener comprises about 2.0% (w/w) to about 30.0% (w/w) of carbamide peroxide.
9. The composition of claim 1, further comprising water present in an amount of about 10.0% (w/w) to about 98.7% (w/w) of the composition.
10. The composition of claim 1, wherein the moisture responsive gel carrier comprises from about 80.0% (w/w) to about 99.99% (w/w) of the composition.
11. The composition of claim 1, wherein the moisture sensitive polymer complex comprises carboxypolymethylene and polyvinylpyrrolidone.
12. The composition of claim 1, wherein the water soluble salt is selected from the group consisting of sodium saccharin, sodium chloride, potassium chloride, and ammonium chloride.
13. The composition of claim 2, wherein the temperature sensitive polymer comprises methylcellulose.
14. The composition of claim 2, wherein the temperature sensitive polymer comprises hydroxypropyl methylcellulose.
15. The composition of Claim 2, wherein the temperature sensitive polymer comprises a poly(oxyethylene)-poly(oxypropylene) block copolymer.

16. The composition of claim 1, wherein the moisture sensitive polymer complex is present in an amount of about 0.01% (w/w) to about 50.0% (w/w) of the composition.

17. The composition of claim 1, wherein the moisture sensitive polymer is present in an amount of about 0.01% (w/w) to about 10.0% (w/w) of the composition.

18. A therapeutic dental delivery device for treating a condition in an oral cavity of a subject, comprising:

a liquid oral therapeutic dental composition;  
an applicator for applying the composition to the oral cavity;  
an activator; and  
a reservoir located between the applicator and the activator and configured to store the composition,  
wherein the activator is configured to dispense the composition from the reservoir to the applicator.

19. The device of claim 18, wherein the therapeutic dental composition comprises a moisture responsive gel carrier and a therapeutic agent dispersed in the moisture responsive gel carrier.

20. The device of claim 19, wherein the moisture responsive gel carrier comprises a moisture sensitive polymer complex and a water soluble salt.

21. The device of claim 18, wherein the applicator is selected from the group consisting of a brush, a felt tip, a roller ball, and a non-woven pad.

22. The device of claim 20, wherein the applicator is selected from the group consisting of a brush, a felt tip, a roller ball, and a non-woven pad.

23. The device of claim 18, wherein the activator is selected from the group consisting of a click mechanism, a twist and ratchet mechanism, and a push button.

24. The device of claim 20, wherein the activator is selected from the group consisting of a click mechanism, a twist and ratchet mechanism, and a push button.

25. The device of claim 18, wherein the applicator comprises a brush and the activator comprises a push button, wherein the push button dispenses the composition to the brush applicator.

26. The device of claim 18, wherein the applicator comprises a brush and the activator comprises a twist mechanism, wherein the twist mechanism dispenses the composition to the brush applicator.

27. The device of claim 18, wherein the applicator comprises a felt tip and the activator comprises a push button, wherein the push button dispenses the composition to the felt tip applicator.

28. The device of claim 18, wherein the applicator comprises a felt tip and the activator comprises a twist mechanism, wherein the twist mechanism dispenses the composition to the felt tip applicator.

29. The device of claim 20, wherein the applicator comprises a brush and the activator comprises a push button, wherein the push button dispenses the composition to the brush applicator.

30. The device of claim 20, wherein the applicator comprises a brush and the activator comprises a twist mechanism, wherein the twist mechanism dispenses the composition to the brush applicator.

31. The device of claim 20, wherein the applicator comprises a felt tip and the activator comprises a push button, wherein the push button dispenses the composition to the felt tip applicator.

32. The device of claim 20, wherein the applicator comprises a felt tip and the activator comprises a twist mechanism, wherein the twist mechanism dispenses the composition to the felt tip applicator.

33. The device of claim 20, wherein the moisture sensitive polymer complex comprises carboxypolymethylene and polyvinylpyrrolidone.

34. The device of claim 19, wherein the therapeutic agent comprises a peroxide.

35. The device of claim 19, wherein the therapeutic agent comprises hydrogen peroxide.

36. The device of claim 19, wherein the therapeutic agent comprises carbamide peroxide.

37. The device of claim 18, wherein the composition is present in an amount of from about 0.01 ml to 1.0 ml.

38. A therapeutic dental pen for treating a condition in an oral cavity of a subject, comprising:

a liquid oral therapeutic dental composition comprising a moisture responsive gel carrier and a therapeutic agent dispersed in the responsive gel carrier, wherein the gel carrier comprises a polymer complex including carboxypolymethylene and polyvinylpyrrolidone and a water soluble salt;

a brush-on applicator for applying the composition to the oral cavity;

a push button; and

a reservoir located between the applicator and the push button and configured to store the composition,

wherein the push button is configured to dispense the composition from the reservoir to the applicator.

39. The pen of claim 38, wherein the therapeutic agent comprises a peroxide.

40. The pen of claim 38, wherein the therapeutic agent comprises hydrogen peroxide.

41. The pen of claim 38, wherein the therapeutic agent comprises carbamide peroxide.

42. A dental therapeutic kit comprising:

a liquid oral therapeutic dental composition comprising a moisture responsive gel carrier and a therapeutic agent;

a delivery device comprising:

an applicator for applying the composition to the oral cavity;

an activator; and

a reservoir located between the applicator and the activator and configured to store the composition, wherein the activator is configured to dispense the composition from the reservoir to the applicator; and

a set of instructions.

43. A method for whitening teeth of a subject in need thereof, comprising:

providing a therapeutic dental composition comprising a moisture responsive gel carrier and a therapeutic agent dispersed in the responsive gel carrier, wherein the gel carrier comprises a polymer complex including carboxypolymethylene and polyvinylpyrrolidone and a water soluble salt; and

applying the composition to a tooth of the subject.

44. The method of claim 43, wherein the composition is applied to the tooth of the subject two times per day.

45. The method of claim 43, wherein the composition is applied to the tooth of the subject three times per day.

46. The method of claim 43, wherein the composition is applied to the tooth of the subject in intervals.

47. The method of claim 43, wherein the composition is applied to the tooth of the subject in fifteen minute intervals.

48. The method of claim 43, wherein the composition is applied to the tooth of the subject in 5 minute intervals.

49. The method of claim 43, wherein the composition is applied to the tooth of the subject in 15 minute intervals 2 times per day.

50. The method of claim 43, wherein the composition is applied to the tooth of the subject in 15 minute intervals 2 times per day.